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Contribution of Material's Surface Layer on Laser Ablation Plasma

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A laser ion source (LIS) utilizes ablation plasma induced by laser irradiation. The plasma comprises multi charged ions which will be extracted and delivered to following accelerators. The highly focused laser irradiation always makes a crater on the material. However the evaporated material is not fully converted to the ions in the plasma. For example our past result[1] showed that a contribution of a 250 nm depth surface carbon layer of an aluminum target was very small on the laser ablation plasma. To clarify the effect of the surface layer of the target material, we are analyzing ion species and charge state distributions in the plasmas produced from carbon coated metal targets with various coating thickness.

References

[1] M. Kumaki et al., Rev. Sci. Instrum., 02B925, 85(2) 2014